What is claimed is

1. A cyclic gas separation process for separating more preferentially permeable gas components from less preferentially permeable gas components of a feed gas mixture of such components, the process comprising the steps of

(a) providing a membrane module having a selectively gas permeable membrane for the more preferentially permeable gas components and the less preferentially permeable gas components,

(b) simultaneously (i) feeding the feed gas mixture to the module to contact the feed gas mixture with a first side of the membrane, (ii) discharging from the module in fluid communication with a second side of the membrane a permeate gas mixture enriched in the more preferentially permeable gas components, and (iii) withdrawing from the module in fluid communication with the first side of the membrane a retentate gas mixture enriched in the less preferentially permeable gas components,

(c) stopping the feeding of the gas feed mixture to the first side, and stopping the withdrawal of retentate gas mixture from the first side,

(d) drawing a vacuum in the module effective to remove a portion of a residual gas resident in the module at the time that the feed and withdrawal are stopped,

(e) ceasing the drawing of vacuum in the module, and

(f) repeating steps (b)-(e).

2. The process of claim 1 which further comprises exhausting the residual gas to ambient atmosphere.

3. The process of claim 1 which further comprises returning the residual gas to the feed gas mixture.

4. A process for reducing atmospheric emissions of volatile organic compound vapor from ullage space of a liquid volatile organic compound storage tank, the process comprising

(a) providing a vapor recovery system comprising (i) a membrane module comprising a two-sided gas permeable membrane comprising a polymer having a glass transition temperature and a selectivity for permeation of air relative to permeation of volatile organic compounds, and (ii) an exhaust pump having an intake and a discharge to ambient atmosphere, in which one side of the membrane defines a feed-retentate chamber on a first side of the membrane in fluid communication with the ullage space and the

second side of the membrane defines a permeate chamber in fluid communication with the intake of the exhaust pump,

(b) for a first length of time simultaneously and continuously (i) conveying a feed gas from the ullage space into the feed-retentate chamber of the module so as to contact the first side of the membrane with the feed gas, (ii) separating the feed gas to form a low organic content gas depleted in volatile organic compounds relative to the feed gas and a high organic content gas enriched in volatile organic compounds relative to the feed gas, (iii) exhausting the low organic content gas from the module to ambient atmosphere, and (iv) returning the high organic content gas from the module into the ullage space in the storage tank,

(c) for a second length of time, stopping the conveying of the feed gas, the exhausting of the low organic content gas and the returning of the high organic content gas,

(d) during step (c) drawing a vacuum in the membrane module to an extent effective to remove a portion of a residual gas resident in the module at the time that the conveying of the feed gas is stopped, and

(e) repeating steps (b)-(d).

5. The process of claim 4 which further comprises exhausting the residual gas to ambient atmosphere.

6. The process of claim 4 which further comprises returning the residual gas to the ullage space.

7. The process of claim 4 in which the vacuum in the module is drawn by operating the exhaust pump.

8. The process of claim 4 in which drawing the vacuum is continued during step (c) for a preselected duration.

9. The process of claim 8 in which the preselected duration is the whole length of time of steps (c) and (d).

10. The process of claim 4 in which drawing the vacuum is continued during step (c) until pressure in the membrane module decreases to lower than a preselected vacuum limit.

11. The process of claim 4 in which drawing the vacuum is continued during step (c) until the volatile organic compound vapor in the permeate chamber decreases to less than a preselected concentration.